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ABSTRACT

Although much speculation has been devoted to concerns over the existence and degree of grade inflation at the high school level, there exists a lack of current empirical data documenting the extent, if it exists, of this phenomenon. This study was designed to investigate evidence of the existence, persistence, and degree of grade inflation by monitoring a large sample of schools over 5 years. Using only schools with at least 30 students taking the American College Test (ACT) resulted in a sample of 5,136 public schools. Decile ranks of student grade point averages and ACT results were compared. Results not only provide evidence supporting the grade inflation hypothesis, but also indicate that the phenomenon appears to be especially substantial at the higher end of the grade point scale. (Contains 5 tables and 13 references.) (Author/SLD)

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High School Grades and Achievement: Evidence of Grade Inflation

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High School Grades and Achievement: Evidence of Grade Inflation

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Abstract

Although much speculation has been devoted to concerns over the existence and degree of grade inflation at the high school level, there exists a lack of current empirical data documenting the extent, if it exists, of this phenomenon. The current study was designed to investigate evidence of the existence, persistence and degree of grade inflation by monitoring a large sample of schools, over a five year period, whose graduates were planning to attend college. The results of this study not only provide evidence supporting the grade inflation hypothesis, but also that the phenonmenon appears to be especially substantial at the higher end of the grade point scale.

High School Grades and Achievement: Evidence of Grade Inflation

Each year approximately 1.1 million college-bound high school juniors and seniors take the ACT Assessment. The ACT Assessment is a battery of curriculum-based achievement tests designed to measure students' critical reasoning and higher-order thinking skills in four core subject areas: Mathematics, English, Science Reasoning and Reading. These tests not only reflect the acquired skills and levels of achievement of students as a result of their high school learning and instruction, but also serve as a measure of students' preparation to undertake rigorous coursework at the postsecondary level.

In addition to the ACT Assessment results, colleges and universities typically require applicants to submit their high school transcripts, teacher recommendations and other supporting evidence to be considered in the admissions and placement process. ACT Assessment test scores, along with high school cumulative grade point averages (GPA), represent the quantitative measures that are typically used by colleges to predict a student's first semester or freshman year college GPA. The results of these predictions also serve to provide additional information regarding admission and placement considerations.

The decision to use these two measures in the equations developed by colleges to predict freshman potential or success, is based on the premise that both variables provide valid and reliable measures of students' high school learning and achievement. However, of these two measures of achievement, high school grades are more subjective due to varying standards and purposes teachers associate with grades (Pilcher, 1994; Brookhart, 1993; Stiggins, Frisbie, & Griswold, 1989). Teachers within schools vary in the criteria they use to judge student achievement; effort and reward are often confounded with grading achievement (Pilcher, 1994).

Likewise, grading practices certainly vary across schools; an "A" in one school may be equivalent to a "C" in a different school (OERI, 1994).

The subjective nature of grades and grading practices, affected by varying standards and/or interpretations on behalf of teachers, contribute to the phenomenon referred to as grade inflation. Operationally, grade inflation exists when there is an increase in grades without a parallel increase in ability (Bejar & Blew, 1981). In this case an indicant of ability would be a student's score on a standardized achievement test such as the ACT Assessment (Wood, 1994).

Although there has been much speculation on the existence and degree of grade inflation at the high school level (Turnbull, 1985; Adelman, 1983; Keith, 1982), there exists a lack of current empirical data documenting the extent of this phenomenon (Bracey, 1994). In the most recent study conducted by the Office of Educational Research and Improvement (OERI), using data collected in the National Education Longitudinal Study of 1988 (NELS:88), researchers documented a large discrepancy between grades reported by eighth grade students in reading and mathematics courses across schools of varying "poverty" levels (measured by the percent of students receiving free and reduced price lunches) and test scores on standardized mathematics and reading tests. Students in schools where more than seventy-five percent received free or reduced price lunches and who reported receiving mostly "A's" in English had, on the average, the same reading test scores as did the "C" and "D" students in the most affluent schools. A similar result was reported for mathematics (OERI, 1994).

Several aspects of this study need to be clarified. First, this study was not directly concerned with investigating grade inflation, as opposed to differences in grading practices across schools. However, it is clear from the results that grade inflation, at least at the low achieving

schools is likely. Second, the study focused on eighth grade and not high school students, which is not to dismiss the concern over differential grading practices or grade inflation at earlier grade levels. Third, the results are based on a single year, as opposed to successive years. Consequently, it is impossible to infer whether this is a unique finding or whether the problem is persistent and the degree to which it is improving or becoming worse. To address these concerns several years of data would have to be collected. Finally, no evidence is provided about the accuracy of student self-reported grades. Students in low performing schools may have a tendency to inflate their reporting of grades (Bracey, 1994).

The current study was designed to investigate evidence of the existence, persistence and degree of grade inflation at the high school level by monitoring a large sample of schools, over a five year period, whose graduates were planning to attend college.

Method

Data

All of the data collected for this study came from ACT's student history files for the years 1989-90 through 1993-94. Only public schools in the United States that had at least thirty ACT-tested students for each of the five consecutive years were retained for this study. This selection criterion resulted in 5,136 public schools being included in the longitudinal analyses, with an average of approximately 530,000 student records per year.

As part of the registration process, prior to sitting for the ACT Assessment, students are asked to indicate which high school courses they have completed and the grades ("A" through "F") they received in each of the completed courses from a preidentified list of 30 standard high school courses. ACT periodically conducts course/grade validity studies, comparing students' self-

reported information to students' high school transcripts, and have found self-reported data to be sufficiently accurate for research purposes (Sawyer, Laing & Houston, 1988).

For purposes of this study, students' records were included only for those for whom course grades were reported in at least three courses in three of the four core content areas of mathematics, science, social science and English, and complete scores on all four tests of the ACT Assessment were present. The course/grade information was used to compute each student's overall grade point average. ACT annually calculates the percentile rank, based on a school's average ACT composite scale score, for all schools that have at least 30 ACT-tested graduates in a given year. This information was used to determine the decile rank for each of the 5,136 schools within each of the five years. School level average GPAs were also calculated.

Analyses

Tables 1 and 2 report the total number of students, student average ACT composite scores, student average GPAs, and standard deviations within each decile for each of the five years. Upon inspection of Table 1, the reader will notice that the average ACT composite scores remain essentially constant, within deciles, across the five year period. However, Table 2 displays a consistent increase in the average GPA across this time span within each decile. Because the sample sizes are large, statistical tests of the differences between average GPAs among the years would all be highly significant.

Using 1989-90 as the baseline year, the standardized differences of average GPA's, within deciles, were calculated for each year to determine the relative magnitude of the change in GPA. Two patterns are discernible from the data presented in Table 3. First, the smallest increases in the standardized differences, across deciles, occured in 1990-91 and 1991-92, with the increases

being more prominent in the last two years. Second, relative to deciles across years, the largest increases in the standardized differences of average GPAs occured in the seventh through tenth deciles. Until more empirical evidence can be accumulated regarding the typical magnitude of the effect size, the interpretation of the standardized differences of the GPAs as large or small is relative and confined to the data presented in Table 3 (Light & Pillemer, 1984; Glass, McGaw & Smith, 1981). Inspection of the data in Table 1 reveals that computing the standardized differences for average ACT composite scores is not necessary because of the constant achievement results across years within deciles.

A more detailed examination of the trends displayed in Tables 1 and 2 is presented in Tables 4 and 5. Table 4 presents trend data related to the percent of students falling into six GPA ranges for the first, sixth and tenth deciles. For the first four GPA ranges, for each of the decile categories, the percent of students falling in the lower GPA ranges has declined across the five year period, while the percent of students falling in the highest two GPA ranges steadily increased across this same time period.

Table 5 displays a breakdown of the 25th, 50th, and 75th quantile ACT composite scores for the first, sixth and tenth deciles within each of the six GPA ranges. An obvious trend is portrayed by the stability of the interquartile score ranges across years within each of the GPA ranges by decile. If student ability had parallelled the increase reflected by GPAs then the quantiles presented in Table 5 would also have increased; however, that is not the case. A careful examination of the interquartile ranges within each GPA category reveals an overlap of the interquartile ranges of the first and tenth decile school students for the first four GPA categories. At the two highest GPA ranges this overlap disappears.

Within the GPA category 3.50 to 4.00, for 1993-94, seventy-five percent of the students in first decile schools score at or below an ACT composite score of 22; whereas, twenty-five percent of the students in tenth decile schools score at or below an ACT composite score of 24. The difference of the quantile ACT composite scores for the first and tenth decile school students is seven scale score points (the ACT score scale range is 1-36), although both groups of students have GPAs in the 3.50 to 4.00 range!

Summary

The focus of this study was investigation of the existence of grade inflation at the high school level. Operationally, grade inflation was defined as an increase in grades without a concommitant increase in ability. The results provide evidence supporting the grade inflation hypothesis. Moreover, not only does there appear to be evidence of high school grade inflation, the phenomenon appears to be especially significant at GPAs greater than 3.00, across all decile categories. The creation of school level decile categories based upon ACT composite averages does not introduce an artifact in this study, because the decile categories averages are free to rise or fall based upon the achievement of each year's group of students. What the results do reveal is that no significant improvement in average student achievement has occured over the five year period investigated regardless of the school attended. In addition, the difference in achievement between students attending schools grouped in the first decile compared to students attending the highest achieving schools, despite the similarity of average GPAs, is substantial. This finding is consistent with the results reported in the OERI study.

An obvious conclusion, which supports common knowledge, is that grading and the standards teachers use to award grades are relative; teachers still award the highest grades to the

"best" students in their classes. In addition, as noted previously, it is difficult to determine whether grades are indeed representative of a student's knowlege of course content, or if other factors, such as attendance, effort, discipline, etc., are included by teachers as part of a student's course grade.

An important issue impacting college admissions, is the weight placed on GPAs, a non-standardized metric, which varies across schools, teachers, and years, as compared to the scores on the ACT Assessment which have the same meaning, relative to student achievement across years and schools. Grade inflation becomes problematic for very selective institutions which typically review applicants with high GPAs. Because GPAs are restricted to a narrow range, 0.00 to 4.00, the prediction equations developed by these institutions will be affected by a GPA "ceiling effect", essentially reducing the variability and therefore the contribution of GPAs to predicting first year college grade point averages.

Table 1

MEAN ACT COMPOSITE by DECILE

	YEAR														
	1989-90			1990-91			1991-92			1992-93			1993-94		
DECILE	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
1	36,289	16.7	3.49	36,582	16.7	3.41	36,790	16.7	3.42	35,658	16.7	3.38	38,098	16.7	3.46
2	33,022	18.7	3.95	31,852	18.7	3.89	32,546	18.7	3.92	30,703	18.7	3.95	29,501	18.7	3.99
3	38,975	19.5	4.13	37,305	19.5	4.05	37,445	19.5	4.07	34,668	19.4	4.06	34,375	19.4	4.08
4	49,095	20.0	4.20	50,262	20.0	4.14	49,148	20.0	4.18	46,818	20.0	4.15	40,062	20.0	4.19
5	49,085	20.4	4.32	44,484	20.4	4.21	52,067	20.4	4.20	50,084	20.4	4.25	44,477	20.4	4.32
6	57,669	20.8	4.38	55,463	20.8	4.24	59,718	20.8	4.25	56,358	20.8	4.27	57,105	20.8	4.33
7	60,751	21.2	4.42	66,970	21.2	4.29	61,872	21.2	4.30	59,461	21.2	4.30	54,525	21.2	4.34
8	55,804	21.6	4.43	55,838	21.6	4.31	64,334	21.6	4.34	62,058	21.6	4.35	58,194	21.6	4.40
9	69,532	22.1	4.52	69,441	22.1	4.38	69,138	22.1	4.40	79,788	22.1	4.38	84,171	22.1	4.42
10	68,957	23.1	4.67	67,322	23.0	4.48	67,303	23.0	4.51	79,400	23.1	4.50	92,765	23.1	4.54
TOTAL	519,199	20.8	4.63	515,518	20.8	4.51	530,361	20.8	4.52	534,996	20.9	4.54	533,273	20.9	4.61

Table 2

MEAN HIGH SCHOOL GRADE POINT AVERAGE by DECILE

	YEAR														
	1989-90			1990-91			1991-92			1992-93			1993-94		
DECILE	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
1	36,289	2.74	0.60	36,582	2.76	0.60	36,790	2.76	0.60	35,658	2.76	0.61	38,098	2.81	0.61
2	33,022	2.87	0.63	31,852	2.86	0.63	32,546	2.89	0.62	30,703	2.90	0.63	29,501	2.93	0.62
3	38,975	2.90	0.63	37,305	2.91	0.63	37,445	2.92	0.63	34,668	2.94	0.63	34,375	2.95	0.63
4	49,095	2.92	0.63	50,262	2.93	0.63	49,148	2.94	0.63	46,818	2.96	0.63	40,062	3.01	0.62
5	49,085	2.95	0.63	44,484	2.95	0.63	52,067	2.99	0.62	50,084	3.01	0.63	44,477	3.03	0.62
6	57,669	2.97	0.63	55,463	2.97	0.63	59,718	2.99	0.63	56,358	3.00	0.63	57,105	3.06	0.63
7	60,751	2.97	0.63	66,970	3.00	0.63	61,872	3.01	0.63	59,461	3.05	0.62	54,525	3.07	0.62
8	55,804	2.98	0.62	55,838	3.01	0.62	64,334	3.02	0.62	62,058	3.05	0.62	58,194	3.08	0.61
9	69,532	2.99	0.63	69,441	3.00	0.62	69,138	3.06	0.62	79,788	3.07	0.62	84,171	3.10	0.61
10	68,957	3.00	0.62	67,322	3.04	0.61	67,303	3.05	0.61	79,400	3.09	0.61	92,765	3.13	0.60
TOTAL	519,199	2.94	0.63	515,518	2.96	0.63	530,361	2.98	0.63	534,996	3.01	0.63	533,273	3.04	0.62

Table 3

Successive Year Standardized Differences of GPAs Within Decile Compared to the 1989-90 Baseline Year

	Year			
Decile	1990-91	1991-92	1992-93	1993-94
1	.03	.03	.03	.12
2	.02	.03	.05	.10
3	.02	.03	.06	.08
4	.02	.03	.06	.14
5	.00	.06	.10	.13
6	.00	.03	.05	.14
7	.05	.06	.13	.16
8	.05	.06	.11	.16
9	.02	.11	.13	.17
10	.06	.08	.15	.21
Overall	.03	.06	.11	.16

Table 4

Percent of Students Within GPA Ranges by Selected ACT Composite Decile Categories: 1989-90 to 1993-94

	Year					
GPA Range	1989-90	1990-91	1991-92	1992-93	1993-94	Average
			Decile = 1			
0.00-1.49	1.4%	1.4%	1.4%	1.4%	1.3%	1.4%
1.50-1.99	7.9%	7.5%	7.7%	7.9%	6.7%	7.5%
2.00-2.49	24.9%	24.5%	24.1%	23.6%	22.3%	23.9%
2.50-2.99	28.9%	29.0%	28.9%	28.5%	28.5%	28.8%
3.00-3.49	24.2%	24.3%	24.4%	25.1%	25.7%	24.8%
3.50-4.00	12.7%	13.3%	13.5%	13.5%	15.5%	13.7%
			Decile = 6			
0.00-1.49	0.8%	0.9%	0.9%	0.8%	0.7%	0.8%
1.50-1.99	4.9%	4.7%	4.7%	4.6%	3.9%	4.6%
2.00-2.49	17.4%	17.3%	16.6%	16.3%	14.1%	16.4%
2.50-2.99	24.8%	24.9%	24.6%	24.4%	23.3%	24.6%
3.00-3.49	27.2%	27.3%	27.7%	27.8%	27.7%	27.6%
3.50-4.00	24.8%	24.9%	25.4%	26.2%	30.1%	26.3%

Table 4 (cont'd)

Percent of Students Within GPA Ranges by Selected ACT Composite Decile Categories: 1989-90 to 1993-94 (cont.)

	Year					
GPA Range	1989-90	1990-91	1991-92	1992-93	1993-94	Average
			Decile = 10			
0.00-1.49	0.7%	0.7%	0.6%	0.5%	0.5%	0.6%
1.50-1.99	4.5%	4.1%	3.8%	3.4%	3.0%	3.7%
2.00-2.49	16.1%	15.2%	14.6%	13.2%	12.4%	14.1%
2.50-2.99	24.5%	23.5%	23.2%	22.3%	21.4%	22.9%
3.00-3.49	27.9%	28.6%	29.1%	29.3%	29.7%	28.9%
3.50-4.00	26.3%	28.1%	28.7%	31.2%	33.0%	29.7%

Table 5

Interquartile Range of Student ACT Composite Scores by GPA Ranges for Selected ACT Composite Decile Categories: 1989-90 to 1993-94

	Year				
Decile	1989-90	1990-91	1991-92	1992-93	1993-94
	GPA Range 0.00-1.49				
1	13,14,16	13,14,16	13,14,16	13,14,16	13,14,16
6	14,16,18	14,16,18	14,16,18	14,16,18	14,16,18
10	16,17,19	15,17,19	16,17,20	15,17,20	15,17,20
	GPA Range 1.50-1.99				
1	13,15,16	13,14,16	13,15,16	13,14,16	13,14,16
6	15,17,19	15,17,19	15,17,19	15,17,19	15,17,19
10	16,18,20	16,18,20	16,18,20	16,18,20	16,18,20
	GPA Range 2.00-2.49				
1	13,15,17	14,15,17	14,15,17	14,15,17	13,15,17
6	16,18,20	16,18,20	16,18,20	16,18,20	16,18,20
10	17,19,22	17,19,22	17,19,22	17,19,21	17,19,21

Note: The values in each cell from left to right are the 25th, 50th, and 75th quantiles.

Table 5 (cont'd)

Interquartile Range of Student ACT Composite Scores by GPA Ranges for Selected ACT Composite Decile Categories: 1989-90 to 1993-94

	Year				
Decile	1989-90	1990-91	1991-92	1992-93	1993-94
	GPA Range 2.50-2.99				
1	14,16,18	14,16,18	14,16,18	14,16,18	14,16,18
6	17,19,21	17,19,21	17,19,21	17,19,21	17,19,21
10	19,21,24	19,21,24	19,21,23	19,21,23	18,21,23
	GPA Range 3.00-3.49				
1	15,17,20	15,17,20	15,17,19	15,17,19	15,17,19
6	19,21,24	19,21,24	19,21,23	19,21,23	18,21,23
10	21,24,26	21,23,26	21,23,26	21,23,26	21,23,26
	GPA Range 3.50-4.00				
1	18,20,23	17,20,23	17,20,23	17,20,23	17,19,22
6	22,25,28	22,24,27	22,24,27	22,24,27	21,24,27
10	25,27,30	24,27,29	24,27,29	24,27,29	24,26,29

Note: The values in each cell from left to right are the 25th, 50th, and 75th quantiles.

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